POTOMAC RIVER ENVIRONMENTAL FLOW-BY STUDY

Submitted to
the United States Army Corps of Engineers
In
Fulfillment of the Requirements of
Article 2.C of
The Potomac River Low Flow Allocation Agreement

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CHAPTER I

RECOMMENDATIONS FOR AN ENVIRONMENTAL

FLOW-BY AND EXECUTIVE SUMMARY

I. Recommendations for an Environmental Flow-by and Executive Summary

Environmental Flow-by Recommendations

The primary "charge" to the State of Maryland in conducting the Environmental

Flow-by Study was to assess the environmental effects of various increments of low flow and make recommendations to the U.S. Army Corps of Engineers for

the establishment of "any amount needed for flow in the Potomac River downstream from the Little Falls dam for the purpose of maintaining environmental conditions" (See Chapters II and V and Appendix D, Potomac River Low Flow Allocation Agreement). To specifically and adequately address the study "charge" in the context of available water management alternatives, the environmental flow-by recommendation will be presented as two separate recommendations:

> RECOMMENDATION #1: Establish a minimum daily environmental flow-by of 100 million gallons a day (mgd) below Little Falls dam. Recommendation #1 will form the basis for implementing the Potomac River Low Flow Allocation Agreement formula.
>
> RECOMMENDATION #2: At a calculated flow of 500 mgd just above the Great Falls intake, begin shifting Aqueduct withdrawals to the Little Falls dam intake to maintain at least 100 mgd plus the Washington Aqueduct's allocation up to 200 mgd between Great Falls and Little Falls dam.

A broad spectrum of Potomac River resources and uses including, the fishery, macroinvertebrates, wildlife, recreation and water quality were analyzed in an effort to gain an understanding of the potential impacts associated with low river flows from zero to 1100 mgd. The impacts of historical low river flow on non-fishery resources and uses, such as boating or wildlife were found to be negligible or of a short term nature, thus are only of minor concern. The fishery resource will be most affected by low river flow.

In establishing the recommended 100 mgd flow-by below Little Falls dam, a few of the factors taken into consideration were:

1. Practical water management realities including historical flow frequency, water supply demand, and water use restriction capabilities, presently limit the amount of water available for a minimum environmental flow-by. A daily average flow below Little Falls dam of 100 mgd is nearly the limit of what the current system can provide during extreme drought conditions.

2. The integrity of the fishery can be protected by establishing a flow-by as a daily minimum rather than a weekly average minimum. In addition, the current low flow allocation formula is calculated on a daily basis.

3. The area of potential impact extends approximately one mile from Little Falls dam to Little Falls – however, the only area of significant concern is a small 22 acre backwater (See Zone 3 fishery discussion in Chapter V.)

4. Of all areas of the Potomac analyzed, the section from Little Falls dam to Little Falls was found to contain the poorest fishery habitat

(averaging six to ten times less habitat available per 1,000 feet than is found above the dam) and is the least accessible for fishing.

5. The species of most concern (and most adversely affected) in the fluvial area below the dam is the juvenile life stage of the smallmouth bass – estimated to number only 3500 juveniles (0 to 3 years of age) in any given year under average flow conditions in the 22 acre backwater.

6. Low flows at the level and duration necessary for a significant decline in the juvenile smallmouth bass population below the dam would be expected to occur only about once in twenty years. It is estimated that the smallmouth bass population would fully recover in approximately 4 years.

After weighing the above factors in terms of existing water supply needs and natural flow frequencies, it was determined that a minimum daily environmental flow-by of 100 mgd is reasonable and will be sufficient to protect the integrity of the fishery below Little Falls dam.

A considerably different environmental and use situation exists above Little Falls dam – necessitating formulation of Recommendation #2. A very productive and highly used fishery exists between Great Falls and Little Falls dam. Even at the lowest flows, there is six to ten times more ideal habitat available per 1000 feet of stream above the dam than below the dam. The gross wetted area per 1000 feet of much of the river above Little Falls dam is more than two times that found below the dam. In addition, thousands of fishermen converge on the area each year as a result of easy access and the challenges offered by a varied and productive fishery.

Based on analysis of low flow related impacts in relation to water management opportunities, an effort should be made to maintain a minimum 100 mgd plus the Washington Aqueduct withdrawals up to 200 mgd between Great Falls and Little Falls dam. Washington Aqueduct withdrawals are usually at or near 200 mgd during late summer and early fall. The integrity of the fishery can be maintained at such a flow that lasts no longer than the recorded historical duration for that flow. By gradually shifting Aqueduct withdrawals to the Little Falls dam Intake when 500 mgd is observed just above the Great Falls intake, up to an additional 200 mgd would be available for environmental purposes down to the dam. Although pumping costs at Little Falls are high (approximately $8,000 a day) such pumping for environmental purposes would only occur on estimated average of one day in seven years.

B. Future Environmental Considerations

RECOMMENDATION: Upon completion and operation of Bloomington Reservoir, establish a monthly flow schedule, based on existing information regarding water management

opportunities, that will optimize in-stream values while meeting water supply needs.

Bloomington Reservoir was constructed for such multiple purposes as water quality control in the North Branch of the Potomac and enhancement of water storage/supply capabilities. According to one management strategy developed by ICPRB CO-OP, operation of Bloomington Reservoir could mean that with "year 2000 demands" and water use restrictions in place, an additional 70 mgd could be made available on a daily basis for environmental concerns, bringing the total environmental flow to 170 mgd. If operated on a weekly average basis a environmental flow of 200 mgd (weekly average) could be maintained. Since there is flexibility in releases from the Bloomington Reservoir, a monthly flow schedule could be maintained in an effort to manage and optimize the fishery environment.

A plan development permit has been issued by the Maryland Water Resources Administration for the proposed construction of Little Seneca Reservoir. ICPRB CO-OP indicates that under certain management strategies, Little Seneca, if constructed and operated on a regional basis, with year 2000 demands and water use restrictions in place, could provide an additional 130 mgd (beyond that which is possible with Bloomington) to meet environmental management objectives. This could bring the total environmental management flow to 300 mgd.

Designation of a specific monthly optimization flow management schedule is beyond the protection-oriented scope of this study. As Bloomington becomes fully operational, a monthly flow schedule is recommended to optimize in-stream and out-of-stream needs to the extent practically possible.

Establishment of a monthly flow schedule could be based on:

1. Additional in-depth analysis and refinement of existing data.

2. "Trade-off" considerations between fish species and life stages as well as among other in-stream values and uses (The decline in low flow associated habitat availability for certain life stages of some key fish species below Little Falls dam is off-set by a corresponding increase in availability of habitat above the dam during low flows – See Chapter VII).

4. Collection of additional needed information on fish life stage requirements.

5. Refinement of system management modeling capabilities.

Other management and institutional considerations that may become evident as efforts are made to fully manage the Potomac.